ABSTRACT

A mobile communication system includes at least three transmission antennas of first to third transmission antennas, and uses an overlapped antenna scheme for grouping the first and second transmission antennas into a first transmission antenna group and grouping the second and third transmission antennas into a second transmission antenna group. First and second modulators modulate L information bit streams to be transmitted through the first transmission antenna group and output first and second modulation symbol streams. Third and fourth modulators modulate L other information bit streams to be transmitted through the second transmission antenna group and output third and fourth symbol streams. First to fourth puncturers puncture at least one modulation symbol in a predetermined position among the first to fourth modulation symbol streams. A multiplexer transmits a modulation symbol stream output from the first puncturer through the first transmission antenna, transmits modulation symbol streams output from the second and third puncturers through the second transmission antenna after summation, and transmits a modulation symbol stream output from the third puncturer through the third transmission antenna.